NETS Future Research

By

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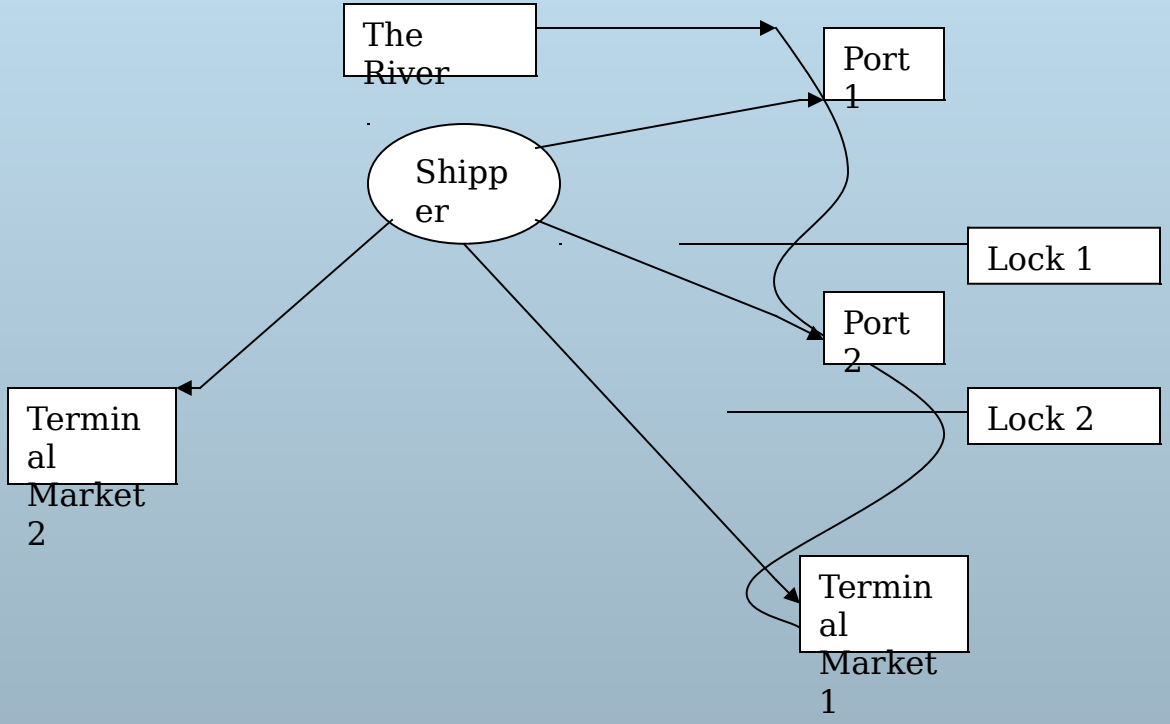
Inland Model



Features of System

- Demanders make mixed continuous/discrete decisions
  - Where to ship
  - How to ship
  - How much to ship

In some markets:

- In some cases, there are procurement decisions that give rise to market areas
  - Bid prices and market areas

Demand Research

- Survey work (Train)
  - Upper Miss/Illinois – Agricultural work
    - Mid-American Grain
    - Upper Miss non-Grain Study
    - Ohio
    - Columbia/Snake
- Revealed Choices on UMISS – Pool to Pool demands (Boyer)

Demand Research

- Transportation demand by an originator is a supply decision by an “originator.” In agricultural markets, there is procurement of the product over space.
- We are attempting to model market areas and the annual volumes of river elevators to different terminal markets using TVA interview data (Kevin Hendrikson)

Supply Work

- Little research conducted on the supply side.
- Classical Structure-Conduct-Performance study of the Tow companies, a documentation of the structure of costs, and an evaluation of the competitiveness assumption (Gene Griffin and Kim Vachal)
- Lock performance (Wilson)

Equilibrium

Simon Anderson

- Given demands, supplies (and pricing behavior), lock performance, and queuing, we are in a position to model equilibriums.
  - The equilibrium model will allow for:
    - various concepts of demands (where, how, and how much) and space across commodities.
    - supply of barge services across multiple markets
      - Tow company operations in multiple commodity markets, multiple rivers, and use a shared resource (the locks).

Related Research

- Forecasting models (Mark Thoma)
  - Long-Run Forecasting
  - Short-Run Adjustments
- Port Development, Inland Transport Systems and International Trade (Bruce Blonigen)

Port Development, Internal Transport Systems and International Trade

- Recent research in Trade has focused on the efficiency of transportation networks in determining:
  - Whether trade occurs
  - The level of trade
- Improvements in the inland waterway and in ports affect transportation costs
  - Clark et. Al (2004) find that improvements in port efficiency from the 25th to 75th percentile reduce shipping costs by 12 percent.

- An improvement can:
  1. Cause a new trade flow
  2. Increase the level of an existing trade flow
  3. Divert flows from (to) another port.

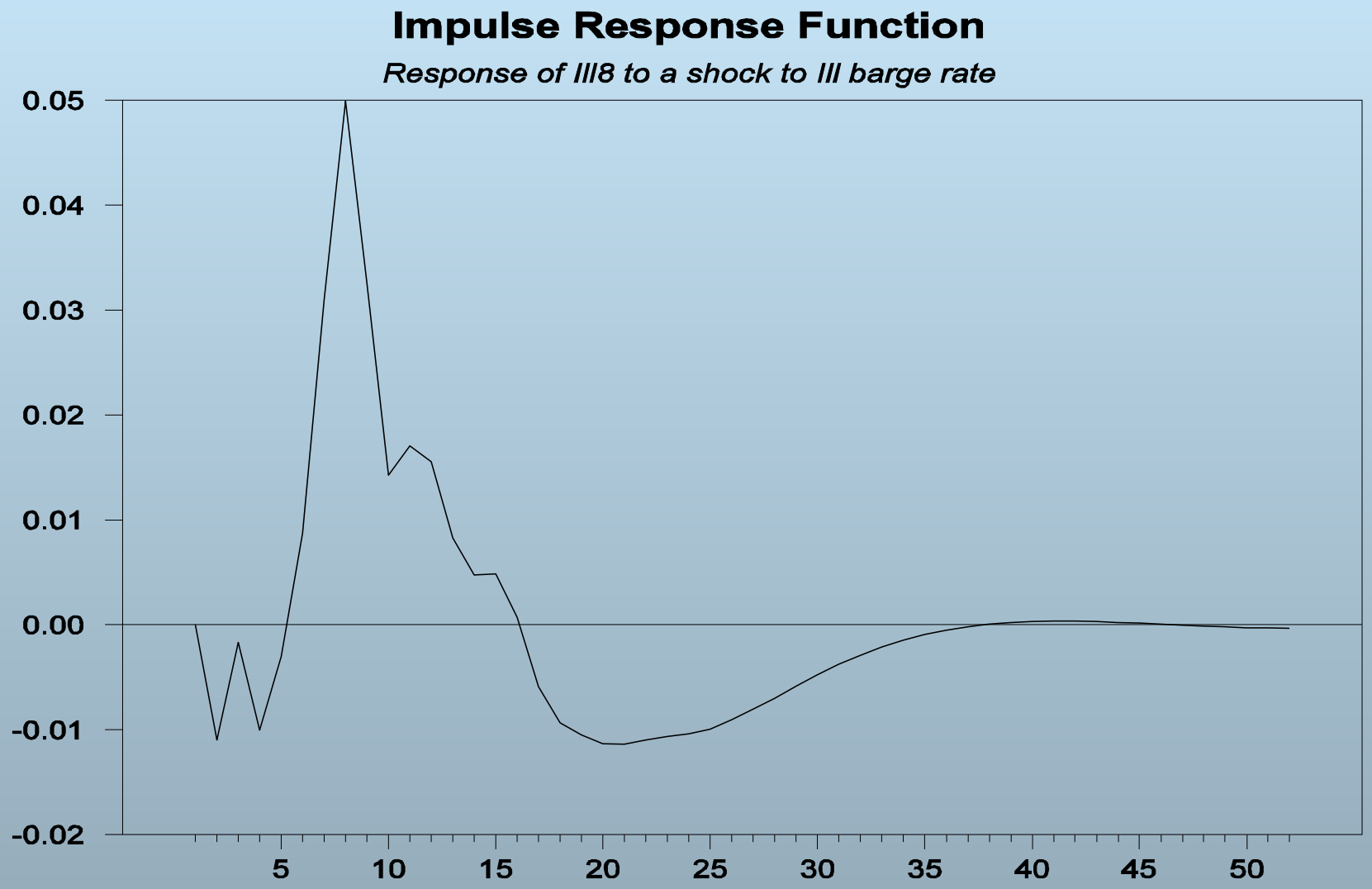
The plan here is to develop measures of inland, port and ocean efficiency measures to explain the patterns and level of trade.

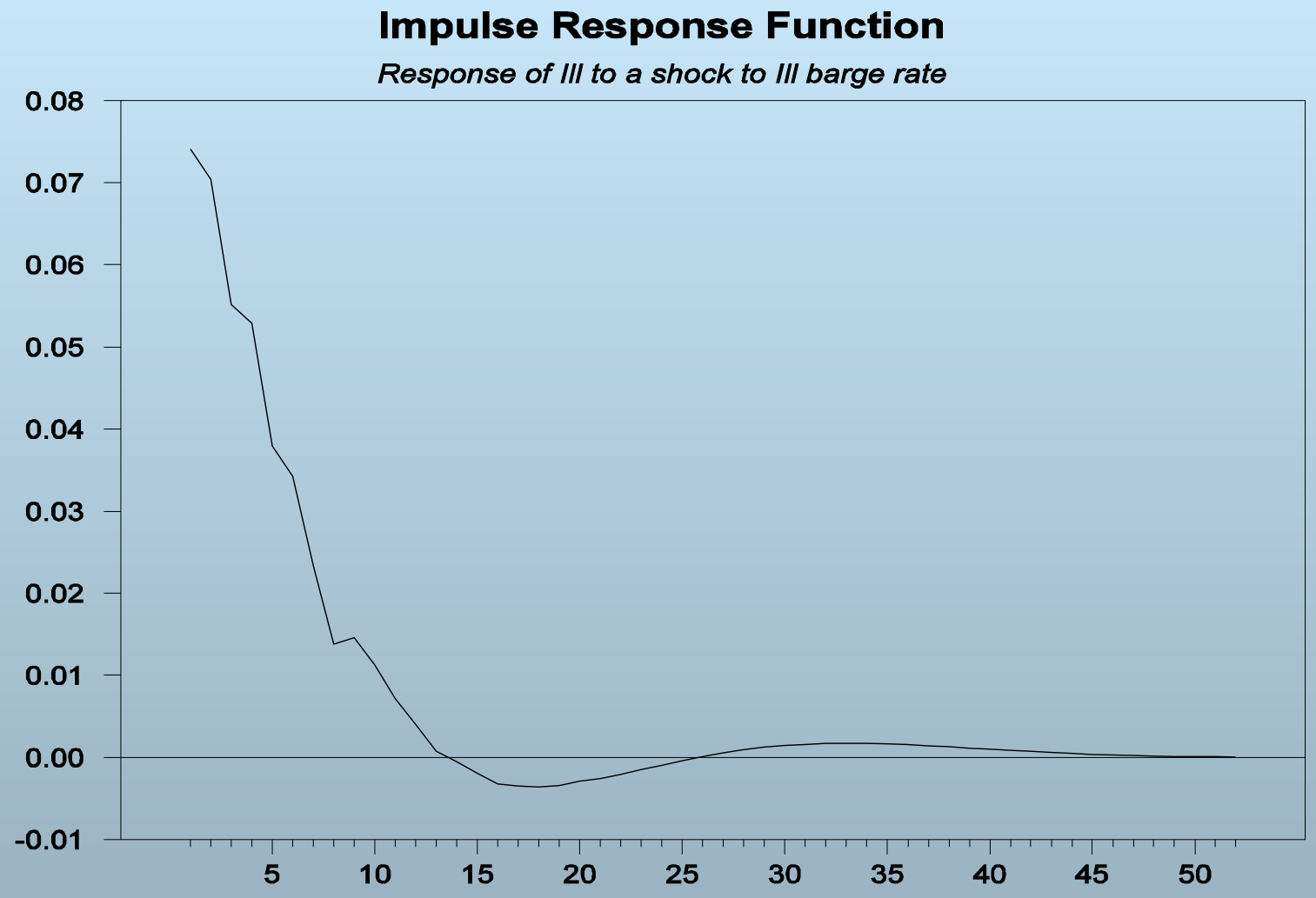
Forecasting Work

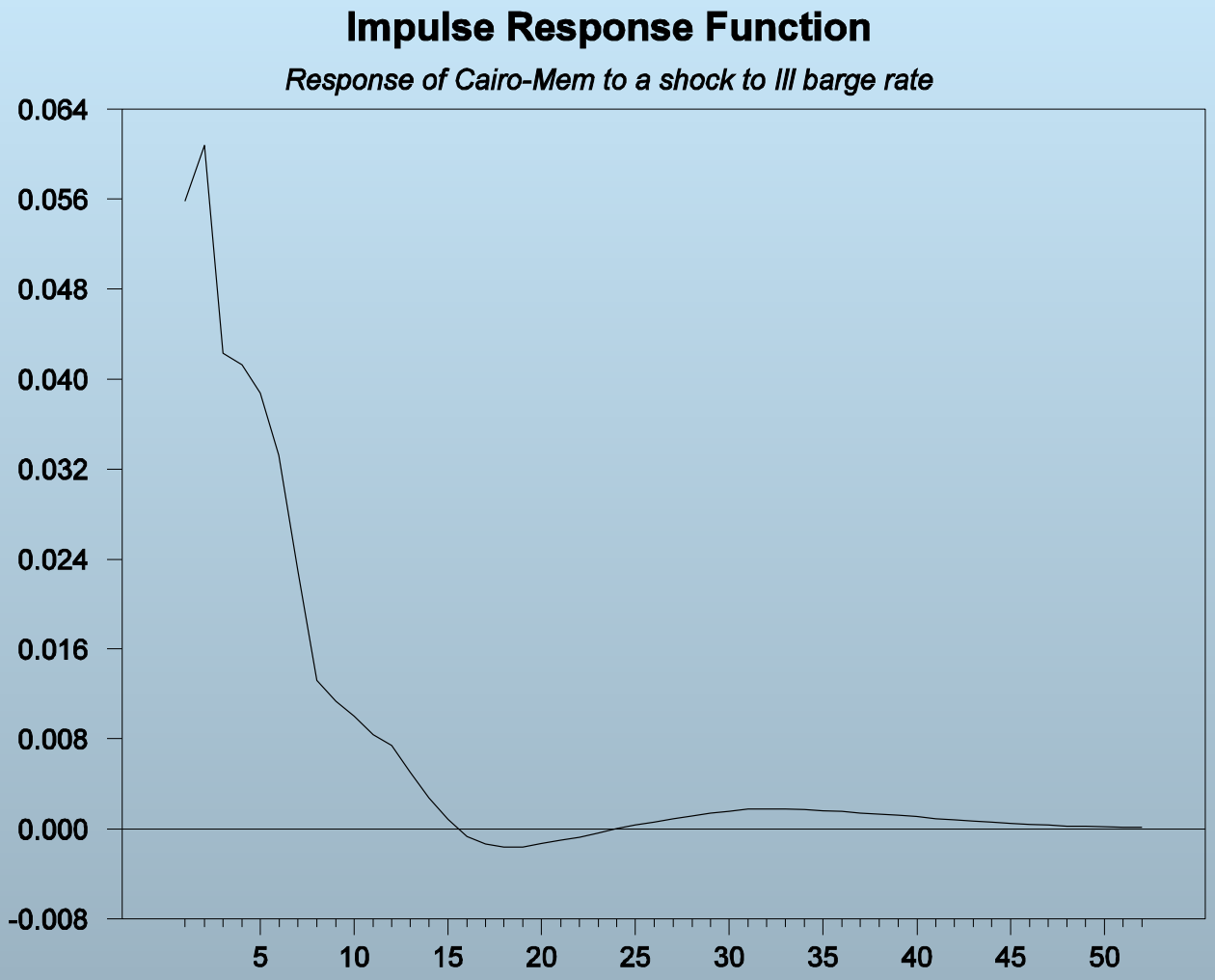
- Use of standard time series techniques to tie key demand drivers to economic drivers.
- Use Vector Autoregression models to assess the short-run dynamic responses to price and congestion innovations across space.

Example

- **Use Grain Transportation Reports (USDA)**
- **Estimate a VAR**
  - **Tonnages passed through three locks:**
    - **Illinois Lock 8, Miss 26 and Miss 27.**
  - **Rates**
    - **Illinois, St.Louis, Cairo, and Lower Ohio**
- **Results are in “impulse response functions.”**


Impulse Response Function
Response of III8 to a shock to III barge rate
0.05
0.04
0.03
0.02
0.01
0.00
-0.01
-0.02
5
10
15
20
25
30
35
40
45
50


Impulse Response Function
Response of Ill to a shock to Ill barge rate
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
-0.01
5
10
15
20
25
30
35
40
45
50


Impulse Response Function
Response of Cairo-Mem to a shock to Ill barge rate
0.064
0.056
0.048
0.040
0.032
0.024
0.016
0.008
0.000
-0.008
5
10
15
20
25
30
35
40
45
50